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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

MOORE, KARLA A

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| ART UNIT | PAPER NUMBER |
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1763

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/659,258 | LAI ET AL. | |
| | Examiner | Art Unit | |
| | Karla Moore | 1763 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-9 and 15-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9 and 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/11/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability (and indicated allowable subject matter) of claims 1-4, 6-9 and 15-19 is withdrawn in view of the newly discovered reference(s) to Ennis. Rejections based on the newly cited reference(s) follow.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 341 and 342. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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2. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2002/0159216 to Ennis.

3. Ennis discloses a plasma apparatus capable of adaptive impedance matching comprising: a plasma reactor (Figures 1 and 2, 10) which produces plasma to proceed with chemical vapor deposition processing; a bipolar electrostatic chuck (Figures 3 and 4; 200) which locates inside said plasma reactor to support and secure a wafer and said bipolar electrostatic chuck has an inner electrode and an outer electrode (paragraph 46; 202 & 204 or 204 & 206 or 202&206); an alternating current bias power (paragraph 57; 240) which connects to said inner electrode and said outer electrode, and said alternating current bias power provides bias for ion bombardment on said wafer; and an impedance matching circuit (multiple part numbers which are described hereafter), said impedance matching circuit connects between said alternating bias power and said bipolar electrostatic chuck in order to balance a power output of said inner electrode and a power output of said outer electrode and said impedance matching circuit includes a plurality of adjustable impedance elements (see paragraph 19 and 63-64; 264), a power-measuring device (268 and 270), a power comparator (20) and an automatic impedance-regulator (272); the power outputs of said plurality of adjustable impedance elements measured by said power measuring device are compared by said power comparator to get a control signal and said control signal is sent to said automatic impedance regulator in order to adjust impedance values of said plurality of adjustable impedance elements. Also see paragraphs 57-75.

4. With respect to claims 2 and 3, said plasma reactor has in alternating current plasma generating power (paragraph 9). The reactor would capable of attaining an operating frequency of said alternating current plasma generating power of approximately between 200KHz and 350 KHz, using the aforementioned power source. Further, the courts have ruled that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). They have also ruled that A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

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5. With respect to claim 4, the alternating current bias power is capable of attaining an operating frequency of said is about 13.56MHz (paragraph 57).
6. With respect to claim 6, said power measuring device has a voltage-meter (paragraph 63) for measuring amplitudes and phases of voltages and a current-meter (paragraph 63) for measuring amplitudes and phases of currents.
7. With respect to claim 7, said power comparator has a transmitter (paragraphs 60 and 61; 248) for sending said control signal.
8. With respect to claim 8, said automatic impedance-regulator (paragraph 62; 250, 252, 254) has a receiver for receiving said control signal.
9. With respect to claim 9, said automatic impedance regulator has a plurality of logic drive motors (paragraph 64; 272).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
12. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ennis in view of U.S. Patent 5,835,333 to Castro et al. With respect to claim 15, Ennis discloses high density chemical

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vapor deposition equipment (i.e. equipment capable of CVD, see paragraphs 13 and 26) with an impedance matching circuit substantially as claimed and comprising: an inductively coupled plasma reactor which has an alternating current plasma generating power (paragraph 9) and said plasma generating power produces plasma to proceed with a high density plasma chemical vapor deposition process; a bipolar electrostatic chuck (Figures 3 and 4, 200) which locates inside said inductively coupled plasma reactor to support and secure a wafer and said bipolar chuck has an inner electrode and an outer electrode (paragraph 46; 202 & 204 or 204 & 206 or 202&206), wherein said inner electrode locates inside the center portion of said bipolar electrostatic chuck and said outer electrode locates inside the outer portion of said bipolar electrostatic chuck outside said inner electrode; a direct current power (230) which connects to said bipolar electrostatic chuck and said direct current power provides plus power to said inner electrode of said bipolar electrostatic chuck and minus power to said outer electrode of said outer electrode of said bipolar electrostatic chuck (paragraphs 53 and 54); an alternating current bias power (paragraph 57, 240) which connects to said inner electrode and said outer electrode and said alternating current bias power provides the bias for ion-bombardment on the wafer; an isolating circuit (paragraph 74, 271) which connects between said direct current power and said alternating bias power, wherein said isolating circuit has a plurality of capacitors (271), wherein said plurality of capacitors are used to prevent direct currents from flowing into said alternating current bias power; and an impedance matching circuit (multiple part numbers which are described hereafter), said impedance matching circuit connects between said alternating bias power and said bipolar electrostatic chuck in order to balance a power output of said inner electrode and a power output of said outer electrode and said impedance matching circuit includes a plurality of adjustable impedance elements (see paragraphs 19 and 63-64; 264), a power-measuring device (268 and 270), a power comparator (20) and an automatic impedance-regulator (272); the power outputs of said plurality of adjustable impedance elements measured by said power measuring device are compared by said power comparator to get a control signal () and said control signal is sent to said automatic impedance regulator in order to adjust impedance values of said plurality of adjustable impedance elements. Also see paragraphs 57-75.

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13. However, Ennis fails to disclose a plurality of inductors used to prevent alternating currents from flowing into said direct current power.

14. Castro et al. teach that in an electrostatic chucking arrangement in a plasma processing apparatus it is typical to provide an inductive filter circuit in series between a DC power supply and chuck for the purpose of isolating an RF component of the chuck from the DC component of the power supply (column 2, rows 17-20).

15. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to have provided a plurality of inductors in the electrostatic chucking arrangement of Ennis in order to isolate the DC and RF components from one another as taught by Castro et al.

16. With respect to claim 16, said power measuring device has a voltage-meter (paragraph 63) for measuring amplitudes and phases of voltages and a current-meter (paragraph 63) for measuring amplitudes and phases of currents.

17. With respect to claim 17, said power comparator (paragraphs 60 and 61; 248) has a transmitter for sending said control signal.

18. With respect to claim 18, said automatic impedance-regulator has a receiver (paragraph 62, 250, 252, and 254) for receiving said control signal.

19. With respect to claim 19, said automatic impedance regulator has a plurality of logic drive motors (paragraph 65, 272).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP's 5812361, 5894400, 5933314, 6215640, 6228278, 6625003 and 6741446 each disclose electrostatic chucks.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Karla Moore
Primary Examiner
Art Unit 1763
7 August 2006